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A TEST OF A VESTED INTERESTS PERSPECTIVE IN A RESERVOIR IMPACTED COMMUNITY [1]

Ted L. Napier
Ohio State University

Michael V. Carter
Ohio State University

Elizabeth G. Bryant
Ohio State University

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The Department of Agricultural Economics and Rural Sociology, The Ohio Agricultural Research and Development Center and The Ohio State University, 2120 Fyffe Road, Columbus, Ohio 43210.

ABSTRACT

Data were collected in 1980 from a sample of 303 adult residents living in a reservoir impacted community located in central Ohio. The sample consists of representatives from over half of all families living in the affected community at the time of the study. The data were used to test a "vested interests" theoretical perspective created from selected components of social exchange theory to assess the nature and direction of social changes which had taken place in the community as a result of the lake project. Two composite indexes were constructed to measure the perceived "extent" of change and the perceived "direction" of change. The findings demonstrated that the theoretical perspective was quite useful in understanding the phenomena under investigation. Four independent variables explained 21.1 percent of the variance in the perceived "extent" of change while five variables explained 53.6 percent of the variance in perceived "direction" of change.

INTRODUCTION

Social impact assessment research focused on water impoundment projects began in the late 1960's as a result of the concern expressed for the social well-being of directly affected people by a small group of social scientists. The efforts of these researchers were legitimized and facilitated by interpretations made of the National Environmental Policy Act (NEPA) of 1969 which mandated that a sociological component be encorporated into environmental impact statements prior to the introduction of federally funded projects. Subsequently, many studies were commissioned and conducted during the decade of the 1970's. Unfortunately, the findings generated to date are frequently inconsistent and sometimes appear contradictory. Examination of the existing research in the field of social impact assessment demonstrates that a variety of methodologies have been used to evaluate the impacts of reservoir projects on directly affected people. Such variances in research methodologies could easily contribute to differences in research findings.

Cross-sectional designs have been used by some researchers to assess anticipated social consequences of water impoundments prior to the introduction of the lake projects (Burdge and Ludtke, 1970; Ludtke and Burdge, 1970; Johnson and Burdge, 1974; Johnson, et al., 1976). Such research is quite useful in assessing how people designated to be disrupted by reservoir construction feel about their future lives and about forced displacement. Quite often these studies have shown that affected community groups react quite negatively to proposed physical displacement and disruption of their communities. Such findings strongly indicate that directly affected people anticipate severe negative consequences from the lake projects and that such perceptions adversely affect impacted people's lives

and psychosocial well-being.

Cross-sectional research studies using multiple-group comparisons (Napier, 1971) and longitudinal assessments of impoundment affected groups (Napier and Moody, 1979; Napier, Bryant and McClaskie, 1981) have added other dimensions to the study of social impacts since comparative analyses cannot be undertaken using cross-sectional data collected from a single group. The multiple-group comparison and longitudinal studies have shown that the social fabric of affected community groups is not destroyed by water impoundment projects even though the lives of affected people are extensively changed by the external change forces.

Ex post facto assessments of lake projects using cross-sectional research design (Bates, 1969; Drucker, et al., 1973; Dwyer, et al., 1981, Hargrove, 1971; Mattson, 1975; Napier, et al., 1982; Prebble, 1969; Smith, et al., 1971; Trock, 1972) have contributed additional insights by demonstrating that water resources projects engender both positive and negative effects for impacted groups. These studies clearly document the nature of the various types of social and environmental impacts which lake projects produce. The research studies by Dwyer, et al., (1981) and Smith, et al., (1971) are particularly important because their findings revealed that certain types of anticipated consequences (socio-economic growth and development) were not realized.

Synthesis of the existing body of knowledge focused on the social impacts of lake projects strongly suggests that major differences exist between the research studies undertaken prior to the introduction of the lake projects and those implemented after the projects have been introduced. The assessment studies conducted prior to the introduction of the lake project show that affected people exhibit considerable fear the social

milieu of the group will be drastically modified and that they anticipate extensive negative consequences to result from the development action. Ex post facto assessments and longitudinal monitoring of impacted groups demonstrate that the social consequences of lake projects are not nearly as negative as anticipated even though the water projects were shown to be quite disruptive of the local social milieu and physical environment.

Such contradictory findings suggest that anticipated impacts may be considerably exaggerated by people living in communities designated as sites for lake projects. The literature also suggests that residents of communities to be impacted by lake projects may over react to the proposed changes and create unnecessary psychosocial problems for themselves.

This sequence of reasoning implies that an unknown portion of the psychosocial impacts of lake projects is self-induced and is probably unnecessary since some of the negative expectations will probably not be realized. The validity of such an interpretation of the existing literature should be examined with empirical data focused on the extent of change and the perceived consequences of the changes.

The purpose of this paper is to present the findings from a study designed to assess the "extent" and "direction" [2] of change in a reservoir impacted community located in central Ohio. The covariates of these factors are examined in the context of a "vested interests model" (Napier and Maurer, 1978; Napier and Mast, 1981; Napier, et al., 1982) developed from utilitarian orientations adopted from social exchange theory. The research findings are discussed in the context of water resources development planning.

A VESTED INTERESTS MODEL

Several assumptions were made prior to the development of the theor-

etical perspective employed in this study. If the assumptions should prove to be invalid for any reason, then the theoretical arguments will be concomitantly weakened. It was assumed that: 1) significant changes were introduced in the local social milieu by external forces when the lake was introduced; 2) local people were cognizant of the changes brought about in the impacted community; and 3) the external change forces associated with the lake construction differentially affected local people and produced variance in terms of the perception of the outcomes.

Since no single, macro-level theory in sociology appeared to be relevant to the phenomena under study, a theoretical perspective based on utilitarian orientations derived from social exchange theory (Ekeh, 1974; Simpson, 1972; Turner, 1974) was created. The model is termed "vested interests" (Napier and Maurer, 1978; Napier and Mast, 1981; Napier, et al., 1982) since benefits and costs are central to the theoretical perspective.

The vested interests model asserts that human beings are reward seeking creatures that wish to avoid internalizing costs. The model posits that individuals evaluate social phenomena in the context of benefits and costs and make judgments about the phenomena being evaluated in terms of the relationship of benefits to costs. While most people do not wish to maximize benefits in every action situation, individuals always seek a favorable benefits to costs relationship. The factors used to develop the overall benefits-costs relationship for each individual will be somewhat different given variabilities in value hierarchies.

Value structures are very important in the assessment of benefit-cost relationships because the vested interests model recognizes a broad range of possible benefits and costs. Unlike economic assessments of benefits

and costs which place the greatest emphasis on monetary definitions of these concepts, the vested interests model recognizes a broad range of benefits and costs which affect assessments of phenomena being evaluated. In addition to economic benefits and costs, the vested interests model recognizes symbolic or qualitative benefits and costs which are more difficult to quantify, such as perceptions of the physical environment. The model also recognizes psychosocial benefits and costs such as gains and losses in happiness or feelings of personal safety. In essence, many factors must be considered when people are making an assessment of a specific phenomenon. Economic, social, psychosocial, and symbolic benefits and costs are evaluated, totaled and a decision is made relative to the value structure of the evaluator. How the individual evaluator perceives the phenomenon being assessed is, therefore, a function of the total matrix of factors influencing perceptions of what constitutes benefits and costs to the individual. While some people are certain to value economic gains and losses much more than other measures of benefits and costs, other people will place much higher priority on alternative measures such as psychosocial well-being associated with nonmonetary variables. This sequence of reasoning suggests that many variables are considered in the decision-making process concerning the benefits-costs relationship and that prediction of the outcome of the assessment is predicated on the ability to measure several types of benefits and costs.

The Application of the Vested Interests Model to Water Resources Projects

While the vested interests model could be used to explain the psychosocial impacts of change programs not yet implimented via <u>anticipated</u> benefits and costs, it is particularly appropriate in the examination of change programs which have been introduced in the past because most of the <u>actual</u> benefits and costs associated with the development action being

assessed are known. Direct experiences with the change forces provide the evaluators with the information necessary to make a realistic assessment of the benefits-costs relationship.

The vested interests model suggests that individuals who derive more benefits and internalize fewer costs from a reservoir project will tend to be more favorably disposed toward the lake project and will tend to view the changes introduced in the group as being positive. Conversely, projects which generate costs in excess of benefits will tend to be perceived negatively. Should there be few benefits and few costs (neutral impacts) associated with the lake project, then the assessment of the project relative to its consequences should be neutral. Therefore, the perceived direction of changes associated with lake projects are direct functions of the benefits and costs associated with them. If the benefits are high, then the group should perceive the lake project as being more beneficial. If the costs are high, then the project should be perceived as being more costly. If the benefits and costs are relatively minor or if the benefits and costs counterbalance each other, then the group will tend to hold a neutral feeling about the lake project.

The magnitudes of benefits and costs should also affect how extensive the affected group feels the lake impacts have been. If the project has generated many benefits, it should be perceived as contributing to considerable change in the affected community. If the project has generated many costs, it should be perceived as introducing considerable change. If there are few benefits and few costs, then the project should be perceived as generating little change.

Since the utilitarian perspective used to build the vested interests model places so much emphasis on benefits and costs, it was deemed necessary to include a variety of benefits and costs measures in the specification of the theoretical model developed for testing. Both direct and indirect

measures of benefits and costs will be discussed and hypotheses presented for testing.

The independent variables selected to measure the direct benefits and costs are: perceived benefits, perceived costs, participation in outdoor recreation, and perception of recreationists. Each of these factors is a type of benefit or cost associated with the lake project.

The indirect measures of benefits and costs are socio-demographic variables which can affect the probabilities that a person will receive benefits and/or costs from the lake project. The socio-demographic factors selected to represent indirect benefits and costs are: sex, age, education, place of early socialization, and length of residence in the affected community.

Perceived benefits is a direct measure of lake induced benefits. If individuals have derived direct benefits from the lake project, then they should perceive the lake as being more beneficial since they should judge the consequences of the changes using a vested interests perspective. Directly affected people should also perceive the changes which have taken place in the community to be extensive since the lake project has changed their potential for gaining benefits. Therefore, it is hypothesized that persons who have received more benefits from the lake project will tend to view the consequences of the project as being more beneficial and as generating more extensive changes than persons receiving fewer benefits.

Perceived costs is a direct measure of lake induced costs. If people must internalize greater costs as a result of the lake project, then they should be more disposed to view the lake project as being more costly because the vested interests model suggests that greater costs should influence the benefits-costs relationship in a negative manner. Local people should also perceive the lake project as generating more extensive changes since the local situation has been modified to the point that local people

must internalize more costs. Therefore, it is hypothesized that individuals who have experienced more costs associated with the lake project will tend to view the consequences of the project as being more costly and as generating more extensive changes than individuals who have experienced fewer costs.

Participation in outdoor recreation is a direct measure of benefits received from the lake project since individuals who recreate more frequently in the outdoors should view the new recreation opportunities associated with the lake project as a benefit. Individuals who engage in outdoor recreation activities more frequently should hold more favorable perceptions of the consequences of the lake development since the vested interests model argues that increased levels of benefits will affect the benefits-costs relationship. Local outdoor recreation opportunities will have been enhanced which is an improvement over the pre-project situation. Therefore, it is hypothesized that individuals who participate more frequently in outdoor recreation activities will tend to view the consequences of the lake project as being more beneficial and as generating more extensive changes than individuals who do not participate as often in outdoor recreation activities.

Perception of recreationists is a direct measure of the local residents' experiences with nonlocal people attracted to the lake project for recreation purposes. If recreationists conduct themselves in a socially accepted manner, then the perceptions of local people should be more favorable since the new social contacts should be perceived as beneficial. Should the recreationists' behavior be offensive to local people, then the perceptions of local people will be more negative and viewed as a cost. Recreationists who conform to socially acceptable modes of behavior will not be much different from local behavioral patterns and would not disrupt established life-styles. This suggests that conformity to local customs

by recreationists will result in very little modification of the local social milieu. Therefore, it is hypothesized that persons holding favorable perceptions of recreationists will tend to view the consequences of the lake project as being more beneficial and as generating relatively little change in the community compared with those who hold negative perceptions of recreationists.

Sex is a socio-demographic factor which can affect the probability that individuals will receive benefits or must internalize costs associated with lake projects. It is argued that females will derive fewer benefits but internalize more of the costs associated with lake development. Since females spend a greater proportion of their time in the local area, they will be subject to more of the potentially negative aspects of lake projects than their male counterparts such as increased fear of "outsiders," noise pollution and other negative factors. Females will probably not participate as frequently in outdoor recreation activities and will not derive as many benefits from the lake project as males. As a result of these potentially negative experiences, females should perceive the changes brought about in their community as being negative and quite extensive. Therefore, it is hypothesized that females will tend to view the consequences of the lake project as being more costly and as generating more extensive changes than males.

Age can affect access to potential benefits and costs of lake development. Older people will be less inclined to participate in outdoor recreation activities which means they will not benefit much from expanded recreational opportunities. They also will react more negatively to changes in their community which they have found to be acceptable over the years. In essence, it is argued that older people will be less adaptable to the accelerated rate of change engendered by lake development and will perceive the changes as being of little benefit to them. Therefore it is hypothesized that older people will perceive the consequences

of the lake project as being more costly and will view the changes as being more extensive than younger people.

Education should affect assessments of costs and benefits since it is a proxy measure for socio-economic status. Individuals with higher levels of education will tend to have higher status. It is argued that higher status people have relatively secure positions in the community and region and will not benefit from the development project. The lake project will, however, generate costs for higher status people because the socio-environmental changes produced in the community such as increased residential density, noise pollution, and disruption by recreationists will introduce significant costs for local people. In essence, it is argued that higher status people will receive few benefits but must internalize the costs of the lake project. Therefore, it is hypothesized that higher educated people will perceive the direction of the change as being more costly and as generating more extensive change than less educated people.

Early socialization refers to where people spent their early years. It is reasoned that people reared in rural farm and nonfarm environments will perceive the changes introduced in a reservoir impacted community, such as increased density of population and changing occupational structures, as constituting costs. People who were reared in small towns and cities as youths should find the changes introduced by the lake project as creating an ecological environment similar to that experienced as a youngster. Such social environments would not be alien to persons with experience living in a small town or city (more densely populated area) and, subsequently, people from more urban oriented environments should perceive the changes as being beneficial and as being less extensive. Therefore, it is hypothesized that people from more urban oriented areas will perceive the consequences of the changes as being more beneficial and as being less extensive than people from rural farm and rural nonfarm backgrounds.

Length of residence is a very important factor in understanding individual responses to lake projects since people with many years of residence in an area affected by a lake project have made many investments in the local community. Most people in rural areas own their homes which further complicates the issue for affected people because they cannot easily resolve the problem by moving. This is especially true for farmers who find it difficult to move entire farming operations. The longer people have lived in an area, the higher the probability that family and friends will be established in the local area and that "social roots" will be implanted in the community of residence. Exogeneous change forces in the form of lake development can easily disrupt the social relationships of long-term residents via physical displacement of population and change the physical environment to the point that long-term residents may define the reconstituted socio-physical environment as being much less desirable than the pre-project community. Each of these conditions would be defined as a cost with few benefits attached to them. Therefore, it is hypothesized that long-term residents will perceive the consequences of the development action as being more costly and as being more extensive than shorter-term residents.

In sum, the research expectations can be summarized as follows:

1. Individuals who have received more benefits from the lake project, have been required to internalize fewer costs, participate more frequently in outdoor recreation activities, have more positive orientations toward recreators, are males, are younger, have lower educational achievement levels, have lived the first few years of their lives in a more densely populated areas, and have lived in the affected community for a shorter time period will tend to perceive the consequences of the lake project as being more beneficial.

2. Individuals who have received more benefits, have internalized

more costs, participate more frequently in outdoor recreation activities, have more negative orientations toward recreationists, are females, are older, have higher educational achievement levels, have spent the first few years of their lives in rural farming areas, and are long-term residents of the community will tend to perceive the changes as being more extensive.

METHODOLOGY

The Study Situation

Data to test the vested interests model as outlined above were collected in 1980 from an adult member of 303 families living in a reservoir impacted community located in central Ohio. The study group was initially disrupted in 1970 by land acquisition implemented by the U.S. Army Corps of Engineers for the purpose of constructing a multipurpose reservoir. Approximately 8,800 acres of privately owned land were appropriated for public use and the lake construction was quickly begun. Long-term residents were displaced from the basin area, forests were felled, buildings were moved or destroyed, cemeteries were relocated, large volumes of earth were mounded to form a dam, and the valley was slowly inundated by rising water. Soon there was little evidence of human habitation in the valley. By 1974 the construction phase of the project was completed and by 1976 the lake had reached summer pool.

Some of the first changes introduced to the local community group were those associated with the construction phase of the project. The quietness of the countryside was shattered by timber crews and heavy machine operations engaged in clearing the land. These disruptions were compounded by large earth movers engaged in building the dam. The natural beauty of the valley was reformed to the desires of man and a way-of-life previously enjoyed by local residents was no more.

Soon the area began to attract the curious observers and the more serious land speculators. People began to purchase homesites and population changes were quickly underway. The study group grew rapidly from approximately 350 families in 1970 to about 600 families in 1980.[3] Such a rate of growth will undoubtedly cause problems in the future since public services will have to be provided. Strip-development around the lake has already made it very difficult and expensive to provide public services such as police and fire protection. When the local group is forced to build central water and sewer systems to prevent water pollution, the uncontrolled development approach employed in the last decade will result in severe economic costs for local people.

Since the lake project is located on the rural fringe of a major metropolitan area in central Ohio, it is easily accessible to hundreds of thousands of people. Subsequently, the lake quickly became a popular outdoor recreation attraction and is expected to remain an important recreation site in the future. The lake is relatively long (13 miles) and narrow (1/2 mile at the widest point) with many inlets that offer excellent sport fishing in the fall and spring which attracts many fisher-persons. The lake is also a popular boating site since it does not have a motor limit as do other lakes in the region. Consequently, noise pollution is a problem at the height of the boating season. A new swimming beach has been constructed which is an added attraction. In sum, the lake will undoubtedly continue to attract many recreationists and the resident population should expect continued visitor impacts.

Even though the lake has attracted many visitors, it has produced relatively few economic benefits for local people. The lake is primarily a day-use facility and such recreation sites have been shown to contribute little to local economies since many recreators using such facilities

bring most of their consumption goods with them to the site (Craven, et al., 1975; Dean, et al., 1978; Dwyer, et al., 1981). Close observation by the principal author for more than 10 years has demonstrated that the economic effects of the lake project have been minimal. Practically nothing has been added to the local economic infrastructure which did not exist prior to the introduction of the project in 1970. Other than increasing local property values, it is highly doubtful that any other economic benefits can be identified in the local area. The loss of agricultural production due to land acquisition, however, must be considered an economic loss to the local community.

While there have been very few positive changes introduced in the local economic structures via new business activities, there have been many changes produced in the occupational structure. The principal occupations present in the community prior to the introduction of the lake project were related in some manner to agriculture. Inmigration to the community combined with limited outmigration of long-term residents (primarily farmers) has produced a rather hetergeneous occupational structure. Many of the local residents now work in adjacent urban communities and have their residence in the study community. In essence, the study community has become another satellite bedroom community for the dominant city in the multi-county region. If the present trend continues, agriculture will soon cease to be a significant component of the local economy.

Although each of the changes noted above has been significant, the greatest impacts have been created by outdoor recreationists attracted to the lake. Hundreds of thousands of user-days each year have been documented by the Corps of Engineers. The local community is literally inundated with recreators during the recreation season.

The lake recreators have introduced many changes in local life-styles as a result of their presence. Higher incidences of trespass, litter, vandalism, and other types of deviant behavior have been reported by local people (Napier, Bryant and Carter, 1981). Local residents indicate that they do not feel as safe as in the past with strangers driving the highways at all hours of the night and walking close to their houses and barns on the way to the lake or river to fish or picnic. The heavy traffic on the local highways during the recreation season creates inconveniences for local people when they wish to commute somewhere in the local area or move farm machinery from field to field.

While there have been numerous negative impacts associated with the lake project, there have also been many positive changes introduced in the community which are frequently ignored when descriptions are made of changes introduced by external change forces. Many excellent recreation facilities have been developed which are available to local people. New friendships have been established as a result of inmigration and young families have been attracted to an area which had been in the process of becoming older. New and better highways were constructed and the utility companies replaced outdated equipment in use. Even certain types of wildlife (deer, ducks, fish, and so forth) are now much more plentiful than prior to the lake project.

In sum, the study community has experienced considerable change forces as a result of the lake project. It is argued the impacted community group selected for study is an appropriate population to assess how reservoir impacted people evaluate the extent and direction of change since the group has experienced significant changes. It is also argued that the assumption made at the beginning of the vested interests model concerning the magnitude of change forces introduced to the study group is valid.

Sample Selection

A systematic random sample (Blalock, 1979) of 303 adults was selected from the resident population of the study community in 1980. Field staff persons were instructed to select every other occupied dwelling and to ask the head-of-household or mate to complete a structured questionnaire. If members of the selected household refused to participate in the study, then the field staff person selected the adjacent occupied residence until consent was received. At this time, the original sampling procedure was reinstated. Over 95 percent of the people asked to participate in the study actually completed a questionnaire. The sample included more than half of all the families in the study community.

A questionnaire was left with each respondent to be retrieved at a later time, usually within 2 days. The questionnaire was designed to be self-administered but the field staff persons provided the respondent the opportunity to ask questions or to talk about any aspect of the questionnaire when they returned to pick-up the completed questionnaire. Any comments or concerns expressed by the respondents were noted on the questionnaire.

The distribution of the respondents was carefully monitored using detailed county maps. This was done to ensure that all areas of the study community were included in the sampling. The characteristics of the sample are provided in Table 1.

(Table 1 Here)

Operationalization of the Study Variables

The "extent" of change variable was operationalized by asking the respondents to circle numbers along a series of scales which measured the extent of change they perceived had occurred in selected components of the community since the lake project was built. The question for each

aspect of the community evaluated was stated as follows: "To what extent have _(issue being assessed)_ changed within the _(lake project name)_ area since the lake was built." Several examples of each issue being assessed were presented in parentheses after each question. An equal interval scale with scores ranging from 0 to 10 was provided after each question and the respondent was instructed to circle the number that best represented their feelings. The 0 value represented no change while 10 represented great change.

Seven different aspects of the community were assessed. The components examined are: community relationships, community services, conformity to laws, quality of the environment, feelings of safety, property values, and access to shopping. The responses to the seven questions were submitted to item analysis for the purpose of building a composite index to facilitate statistical analyses. Two items were excluded from the composite index after initial item analysis since they had very low correlations with the other items. The revised five item index has an alpha of 0.71 which is quite acceptable in social science research.

A composite index for the extent of change was calculated by summing the weighting values for the five items composing the final index. Missing data were given the variable mean and retained for further analyses. The index scores were used in the statistical analyses to test the theoretical perspective. The descriptive statistics for the extent of change index are provided in Table 2.

(Table 2 Here)

After the respondent had evaluated the extent of change for a particular component of the affected community, they were immediately asked to assess the "direction" of the change being evaluated. Each respondent was asked the following question, "Do you believe the changes noted in _(issue being assessed)_ have been beneficial to the community (positive

effects) or costly (negative effects)?" The possible responses ranged from -5 to +5 with -5 representing very costly and +5 representing very beneficial. A 0 value represented a "neither costly nor beneficial" response. The same issues evaluated in the extent of change index were evaluated in the direction of change index.

The responses to the direction of change items were rescored using a range of possible scores of 1 to 11. A -5 score (very costly) received a value of 1 while a +5 score (very beneficial) received a value of 11. A standardized item alpha was calculated to determine the reliability of the index.

The item analysis produced an alpha of 0.82 which is quite good. All seven of the items composing the original index were retained. The weighting values were summed to form a composite index and these data were used in subsequent statistical analyses. Missing data were assigned the variable mean and used in subsequent statistical analyses. The descriptive statistics for the direction of change index are provided in Table 3.

(Table 3 Here)

Direct assessments of benefits and costs were measured by four factors and used as independent variables. The variables are: perceived benefits, perceived costs, participation in outdoor recreation, and perception of recreationists.

Perceived benefits was measured by asking the respondents if his/her family had ever experienced any positive things associated with the lake project. The respondents were asked about: increased recreational opportunities, employment, increased property values, better local roads, more business, better public services, better flood protection, more beautiful area, better shopping facilities, better water supply, increased income, better relationships in the community, increased feelings of safety,

better variety of goods at local stores, profitable sale of land for development purposes, and other. A "yes" response was weighted 1 and "no" responses received a 0. The weighting values were summed to form a composite index of perceived benefits.

Perceived costs was measured by asking the respondent if his/her family had ever experienced any negative things associated with the lake project. They were asked about: litter on their property, trespass of their property, noise pollution due to motor boats, higher taxes to support local government, vandalism of their property, longer bus rides to school for their children, fear for their safety in their home, harassment by recreators, loss of privacy, loss of business, loss of income, loss of a rural way of life, higher taxes for schools, noise due to traffic, decrease in quality of public services, and other. A "yes" response was given a value of 1 and a "no" response was given a value of 0. The responses were summed to form an index of perceived costs.

Outdoor recreation participation was measured by asking the respondents how many times they or members of their family had participated in outdoor recreation activities other than on their own property during the past year. The possible responses were presented in 7 categories of 5 units each beginning with a "0" times category and ending with a "more than 25" times category.

Perception of recreationists was measured using a semantic differential technique (Osgood, 1967; Tannenbaum, 1969) which consists of asking the respondents to choose a number on a continuum located between pairs of adjectives. The numbers on the continuum ranged from +5 (positive toward recreationists) to -5 (negative toward recreationists). A zero represented a neutral position for each adjective pair. Seven adjective pairs were used to complete an incomplete sentence which was stated as

follows: "Outdoor recreationists are:." The adjective pairs were: unpleasant-pleasant, dishonest-honest, disruptive-peaceful, bad-good, dirty-clean, worthless-valuable, and unwelcome-welcome. The responses were weighted 1 through 11, with a response of -5 receiving a value of 1 while a response of +5 received a value of 11.

These data were submitted to item analysis and a standardized item alpha of 0.95 was produced which is very high. The weighting values were summed to form a composite index and these data were used in subsequent analyses. The frequency responses and alpha coefficient for the perception of outdoor recreationists scale are presented in Table 4.

(Table 4 Here)

The socio-demographic factors selected for examination are: sex, age, education, early socialization, and length of residence.

Sex was measured by asking the respondent to indicate his/her sex. Males received a value of 1 and females a value of 2.

Age was measured as age of the respondent at last birthdate.

Education was measured as the number of years of formal education the respondent had completed at the time of the study.

Early socialization was measured by asking the respondent where he/she spent the first 15 years of life. The possible responses to the question were: rural farm, rural nonfarm, small town (under 2,500 people), town (2,500-10,000 people) and city (10,000 or more people). The responses were weighted 1 through 5 with 1 representing "rural farm" and 5 representing "city."

Length of residence was measured by asking the respondent how many years he/she had lived in the study community.

Missing data were assigned the variable mean for all of the variables measured and retained for subsequent analyses.

Statistical Analyses

Descriptive statistics were used to examine general trends in the data while multivariate statistics were employed to examine the merits of the theoretical perspective. It was assumed that the perceptional and categorical data produce metric measures (Abelson and Tukey, 1970; Labovitz, 1970; Kim, 1975) which permits the use of parametric statistics. It is argued that the "robustness" of the parametric statistics more than adequately compensates for measurement error. Correlational analyses were used to test the merits of the theoretical hypotheses and multiple regression analyses were used to determine the relative explanatory power of the predictive variables when all of the independent factors were considered simultaneously.

FINDINGS

Descriptive Findings

The descriptive data presented in Table 2 demonstrate that the perceived extent of change varied from very little to considerable depending on the issue being assessed. It should be noted, however, that none of the issues evaluated were perceived as being greatly changed. Access to shopping was perceived to have changed very little over time. Community relationships and community services were perceived to have changed somewhat while conformity to laws, feelings of safety, and quality of the environment were perceived to have been somewhat more extensively changed. Property values were perceived to have changed considerably.

Data in Table 3 show that the perceived direction of change also varied by the issue being evaluated. Changes associated with community relationships and access to shopping were perceived to have been neither

costly nor beneficial. The changes observed in the community services and the quality of the environment were perceived to have been very slightly negative. Conformity to laws and feelings of safety were perceived to have been somewhat costly while change in property values was perceived to have been slightly beneficial.

Data in Table 4 show that the study respondents perceived the outdoor recreationists in a neutral to slightly favorable manner except for perceptions of cleanliness. The respondents believed that recreationists were slightly dirty.

In sum, the descriptive statistics indicate that some changes were perceived to have occurred in the community but that great change was not perceived to have occurred in any of the issues evaluated. The data for the direction of change revealed that the group perceived very slightly negative consequences associated with the changes.

Overall, the descriptive findings indicate that the extent of the changes produced by the lake project were relatively moderate to slight and that the direction of the changes was neutral to very slightly negative.

Correlation Findings

Correlational analyses were used to test the merits of the hypotheses created for testing. The correlation matrix is presented in Table 5.

(Table 5 Here)

The correlational analyses for the extent of change revealed that only four of the nine independent variables were significantly correlated with the extent of change index factor at the .05 level. The four variables shown to be significantly related are: perceived costs, place of early socialization, length of residence, and perception of recreationists. Each of the variables shown to be significantly related with the extent of change index were correlated in the expected direction.

Eight of the nine independent variables were shown to be significantly correlated with the direction of change index at the .05 level. The only independent variable shown not to be significantly related to the direction of change index factor was sex. All of the other independent variables were correlated with the direction of change in the hypothesized direction. With the exception of sex, the hypotheses as stated were supported.

Regression Findings

Step-wise regression analyses were conducted on the data set to determine the relative explanatory power of the independent variables when all factors were considered simultaneously. The variances in the extent of change index scores and the direction of change index scores were regressed against the 9 independent variables noted above for the purpose of building the best explanatory models.

The regression findings for the extent of change index scores are presented in Table 6. Four variables were shown to be significant in reducing the unexplained variance in the dependent variable. The four variable model explained 21.1 percent of the variance in the extent of change index variable. The best regression model is presented in standardized partial regression coefficient form:

$$y = 0.299x_1 - 0.212x_2 - 0.144x_3 + 0.124x_4 + e$$

where: y = Extent of change index score
x_1 = Perceived costs
x_2 = Perception of recreationists
x_3 = Place of early socialization
x_4 = Perceived benefits
e = Residual error

(Table 6 Here)

The regression findings for the direction of change index scores are presented in Table 7. Five of the independent variables were shown to be significant in reducing the unexplained variance in the direction of

change index scores. The five variable model explained 53.6 percent of the variance in the dependent variable. The best regression model is presented in standardized partial regression coefficient form:

$$y = 0.289x_1 + 0.384x_2 - 0.244x_3 - 0.112x_4 - 0.120x_5 + e$$

where: y = Direction of change index score
x_1 = Perception of recreationists
x_2 = Perceived benefits
x_3 = Perceived costs
x_4 = Education
x_5 = Length of residence
e = Residual error

(Table 7 Here)

CONCLUSIONS AND IMPLICATIONS

The research findings strongly support the vested interests model as it was developed for this study. Three of the four direct measures of benefits and costs were shown to be significant in the regression analyses in reducing the unexplained variance for both dependent variables. The observed significant relationships were all related in the expected direction. The three independent variables purported to be direct measures of benefits and costs are: perceived benefits, perceived costs, and perception of recreationists. These findings strongly suggest that knowledge of direct benefits and costs is quite useful in predicting the perceived extent of change and the perceived consequences of those changes. The socio-demographic factors shown to be significant in the regression analyses also support the vested interests model. Place of early socialization was an important explanatory variable for extent of change while education and length of residence were important predictive variables for direction of change.

These findings clearly indicate that value judgments associated with

the assessments of the extent and the direction of lake induced change are greatly influenced by direct benefits and costs and secondarily by factors that will influence the probability an individual will receive benefits and/or costs. Such findings strongly suggest that agencies commissioned to implement large lake projects should strive to enhance benefits and reduce costs for local people. The five most frequently noted benefits reported by the respondents were: increased property values (N=186), followed by recreation opportunity (N=174), more beautiful area (N=107), flood protection (N=101), and better roads (N=92). The remaining factors were not perceived by many to have been benefits for them. The nine most frequently mentioned costs noted by the local respondents were: litter on property (N=211), traffic noise (N=180), higher taxes for local government (N=144), loss of rural way-of-life (N=124), fear for safety (N=115), trespass (N=113), higher taxes for schools (N=81), loss of privacy (N=75), and noise from motor boats (N=75). The remaining costs were noted much less frequently.

These data combined with the correlation and regression findings strongly suggest that water resources development agencies engaged in lake projects can affect the perceptions held by local people via more careful planning and provision of empirical information to local people. The development agency should plan development programs in such a way as to: maximize the increase in post-project property values, provide recreation facilities more closely aligned to local people's recreation needs, maintain the physical environment in its most attractive form, provide local people with information noting how flood protection will be increased, and inform people how the local roads will be improved. The development agency should also be actively engaged in reducing the observed costs for local people. By reducing costs, the benefits-costs relationship will

become more favorable and the perceptions of the extent of change and the consequences of the change will become more favorable. During the planning process for lake development, provisions should be made to: prevent litter of private property, control traffic noise, provide economic compensation to affected community groups which experience rapid population growth for financing local government functions and increased demands on schools, provide supplemental economic resources to affected groups to develop or to purchase services from existing control agencies to ensure that visitors to the area conform more closely to local conventions of behavior so that local people will not be forced to live in fear. The privacy of local people should be protected while they are located on their own property.

In these ways costs can be reduced and benefits increased for local people. Such a situation should greatly increase the perceived favorability of the lake projects. Should such recommendations be implemented it is quite possible that local groups will begin to view the consequences of lake projects as being very beneficial to the local community. It is also likely that the perceived extent of change would be perceived to be less with the reduction in costs.

Two of the most important findings resulting from the study are derived from the descriptive data. The extent of change was perceived by local people to have been moderate to slight while the direction of change was perceived to have been neutral to slightly negative. These findings strongly support the assertion made early in this paper that anticipated outcomes and fears expressed about lake development are probably overstated in pre-project situations. Many discussions initiated by the principal author with local people prior to the introduction of the lake project combined with detailed written responses to

open-ended questions included in the 1970 study questionnaire revealed that local people anticipated great problems and very adverse outcomes which were apparently not realized. Past observations compared with these study findings suggest that self-induced anxiety contributed to the psychosocial costs of the lake project and that such costs were probably unjustified.

There are several implications for future research which may be derived from this study. While it has been shown that local people designated to be impacted by lake projects are not much influenced by information provided about the project prior to its introduction (Burdge and Ludtke, 1970) they may respond quite well to empirical data collected from comparable groups who have experienced the types of changes they will encounter. A second implication is that future social impact assessment studies of lake projects, especially those conducted as components of Environmental Impact Statements and used to make decisions of whether a project should be implemented, should not be based on assessments of anticipated consequences but on data derived from projects already examined ex post facto which are similar in nature. To accomplish this goal, social scientists should undertake extensive ex post facto research of many lake projects (other types of stimuli as well) and evaluate actual impacts from which more accurate predictions of social impacts can emerge. If a sufficient knowledge base can be generated, then extensive empirical analyses of the social impacts of every lake project will not be necessary.

If social scientists can build good prediction models from ex post facto assessments of lake projects, we will be in a much better position to counsel development agencies relative to use of social science data for planning purposes. Social scientists in general and sociologists in particular have been perceived by some development agencies as being

adversaries or not capable of aiding in the decision-making process. Should we be able to generate the predictive models this orientation should change. It should be recognized that rational decision-making was the expressed purpose of NEPA and was the driving force for many social scientists to undertake social impact assessment research. It is possible that examination of actual impacts will provide the means of accomplishing this objective.

FOOTNOTES

1. Funding for the conduct of this study was provided via the Hatch 645 project administered by the Ohio Agricultural Research and Development Center, Wooster, Ohio. The authors wish to thank Lyndal K. Napier for her secretarial support during the conduct of this research.

2. Extent of change refers to the relative degree of change which has occurred in the impacted community over time. Direction of change refers to the consequences of change which have occurred in the impacted community over time.

3. Population estimates were made by field staff during the conduct of the interviewing. Occupied dwellings were counted during the data collection phases of the study in 1970, 1974 and 1980.

Table 1: Summary Descriptive Statistics For Study Sample (N=303)

Characteristic		Sample Data*
Sex	Percent Male	54.1%
	Percent Female	42.6%
	No Data	3.3%
Age	Mean	46.07
	Standard Deviation	15.42
Education in Years Completed	Mean	13.40
	Standard Deviation	2.50
Income for Total Family	$ 0 -$ 4,999	2.31%
	$ 5,000-$ 9,999	6.27%
	$10,000-$14,999	11.88%
	$15,000-$19,999	11.55%
	$20,000-$24,999	12.54%
	over $25,000	31.35%
	No Data	24.09%
Number of Children at Home	Mean	1.25
	Standard Deviation	1.26
Farming Status	Currently Farming	24.6%
	Not Farming	71.6%
	No Data	3.8%
Length of Residence in Years	Mean	18.31
	Standard Deviation	18.31
Relocation Status	Forced to move because of impoundment	5.3%
	Not Forced to Move	94.4%
	No Data	0.3%
Property Purchased by Development Agency	Yes	11.9%
	No	83.5%
	No Data	4.6%
Home Ownership	Own	86.5%
	Rent	11.2%
	No Data	2.3%

* Percentages may not sum to 100.0% due to rounding error.

Table 2: Descriptive Statistics* and Alpha Reliability Coefficient For Responses to the Extent of Change Scale (N=303)

Extent of Change In:	Possible Responses: No Change	0	1	2	Some Change 3	4	5	6	Considerable Change 7	8	9	10	Great Change	Mean	S.D.	Missing Data
1. Community Relationships	28.1 (85)	7.9 (24)	7.6 (23)	15.2 (46)	6.3 (19)	6.9 (21)	3.3 (10)	5.9 (18)	4.6 (14)	1.7 (5)	4.0 (12)			3.1	2.9	8.6 (26)
2. Community Services	24.8 (75)	7.6 (23)	6.3 (19)	16.5 (50)	4.3 (13)	7.6 (23)	4.3 (13)	6.3 (19)	6.3 (19)	2.6 (8)	5.9 (18)			3.5	3.1	7.6 (23)
3. Conformity to Laws	16.2 (49)	3.0 (9)	6.6 (20)	8.9 (27)	1.7 (5)	8.9 (27)	7.9 (24)	9.6 (29)	10.2 (31)	5.0 (15)	14.9 (45)			5.2	3.4	7.3 (22)
4. Quality of the Environment	4.6 (14)	2.3 (7)	4.6 (14)	13.2 (40)	6.3 (19)	9.2 (28)	7.9 (24)	12.2 (37)	10.9 (33)	5.0 (15)	14.5 (44)			5.9	2.8	9.2 (28)
5. Feelings of Safety	10.9 (33)	3.3 (10)	5.6 (17)	14.9 (45)	3.6 (11)	6.3 (19)	5.3 (16)	9.6 (29)	6.9 (21)	5.3 (16)	17.8 (54)			5.4	3.3	10.6 (32)
6. Property Values**	1.0 (3)	0.7 (2)	3.0 (9)	7.6 (23)	3.6 (11)	6.9 (21)	6.3 (19)	17.8 (54)	16.2 (49)	7.3 (22)	23.4 (71)			7.1	2.4	6.3 (19)
7. Access to Shopping**	56.4 (171)	10.6 (32)	6.3 (19)	6.9 (21)	1.3 (4)	4.6 (14)	2.6 (8)	1.3 (4)	1.3 (4)	0.3 (1)	1.3 (4)			1.3	2.2	6.9 (21)

Standard Item Alpha For Scale Reliability = 0.71
Mean Scale Score = 23.1 Standard Deviation = 10.5

*The data are presented as percentages with frequencies contained within the parentheses. The percentages may not sum to 100.0% due to rounding error.

**Items excluded from the scale.

Table 3: Descriptive Statistics* and Alpha Reliability Coefficient For Responses To Direction of Change (N=303)

Direction of Change In:	Possible Responses											Mean	S.D.	Missing Data
	Very Costly		Somewhat Costly		Little Cost	Neither Costly Nor Beneficial	Very Little Benefit		Somewhat Beneficial		Very Beneficial			
	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5			
Weighting Values	1	2	3	4	5	6	7	8	9	10	11			
1. Community Relationships	4.6 (14)	1.7 (5)	12.5 (38)	1.3 (4)	7.6 (23)	25.1 (76)	10.6 (32)	4.3 (13)	14.5 (44)	2.6 (8)	2.6 (8)	6.1	2.3	12.5 (38)
2. Community Services	5.6 (17)	3.3 (10)	12.5 (38)	5.0 (15)	7.6 (23)	26.1 (79)	6.3 (19)	3.6 (11)	9.6 (29)	5.0 (15)	2.0 (6)	5.7	2.4	13.5 (41)
3. Conformity To Laws	10.9 (33)	5.9 (18)	22.8 (69)	6.9 (21)	8.3 (25)	15.2 (46)	4.6 (14)	2.0 (6)	4.0 (12)	2.3 (7)	1.7 (5)	4.5	2.3	15.5 (47)
4. Quality of the Environment	8.3 (25)	5.6 (17)	19.5 (59)	7.3 (22)	6.3 (19)	10.6 (32)	6.6 (20)	3.3 (10)	10.9 (33)	5.6 (17)	5.0 (15)	5.4	2.9	11.2 (34)
5. Feelings of Safety	13.2 (40)	7.3 (22)	27.1 (82)	7.3 (22)	7.9 (24)	15.2 (46)	4.6 (14)	2.0 (6)	2.3 (7)	0.7 (2)	0.3 (1)	3.8	2.1	12.2 (37)
6. Property Values	5.0 (15)	3.0 (9)	12.2 (37)	2.6 (8)	2.0 (6)	6.3 (19)	5.0 (15)	9.2 (28)	24.4 (74)	9.9 (30)	11.9 (36)	7.3	2.9	8.6 (26)
7. Access to Shopping	1.0 (2)	0.3 (3)	5.3 (1)	2.3 (16)	4.3 (7)	58.7 (178)	7.6 (23)	2.3 (7)	4.6 (14)	0.7 (2)	0.7 (2)	5.9	1.4	12.3 (37)

Standard Item Alpha For Scale Reliability = 0.82
Mean Scale Score = 38.7 Standard Deviation = 11.4

*The data are presented as percentages with frequencies contained within the parentheses. The percentages may not sum to 100% due to rounding error.

Table 4: Descriptive Statistics* And Alpha Reliability Coefficient For Responses to the Perception of Outdoor Recreationists Scale (N=303)

"Outdoor Recreationists Are:"	Very	Somewhat		A Little		Neutral	A Little		Somewhat		Very	"Outdoor Recreationists Are:"	Mean	S.D.	Missing Data
Weighting Values	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5				
	1	2	3	4	5	6	7	8	9	10	11				
Adjective												Adjective			
Unpleasant	5.9 (18)	2.3 (7)	3.3 (10)	5.0 (15)	5.9 (18)	14.5 (44)	7.3 (22)	5.6 (17)	15.8 (48)	10.9 (33)	12.9 (39)	Pleasant	7.2	2.8	10.6 (32)
Dishonest	3.0 (9)	1.0 (3)	3.3 (10)	2.0 (6)	7.3 (22)	23.8 (72)	5.9 (18)	5.6 (17)	14.2 (43)	10.2 (31)	9.2 (28)	Honest	7.3	2.4	14.5 (44)
Disruptive	12.9 (39)	4.3 (13)	6.3 (19)	4.0 (12)	9.6 (29)	10.2 (31)	5.3 (16)	5.9 (18)	11.9 (36)	9.6 (29)	7.9 (24)	Peaceful	6.1	3.1	12.2 (37)
Bad	3.3 (10)	2.3 (7)	2.6 (8)	3.0 (9)	5.0 (15)	21.1 (64)	7.3 (22)	6.6 (20)	13.2 (40)	9.6 (29)	10.2 (31)	Good	7.2	2.4	15.8 (48)
Dirty	15.8 (48)	3.6 (11)	3.6 (11)	5.0 (15)	6.6 (20)	16.2 (49)	4.3 (13)	6.6 (20)	9.9 (30)	7.9 (24)	8.3 (25)	Clean	4.9	3.1	12.2 (37)
Worthless	4.0 (12)	2.0 (6)	1.0 (3)	2.3 (7)	4.3 (13)	24.4 (74)	10.2 (31)	8.3 (25)	10.6 (32)	7.3 (22)	10.9 (33)	Valuable	7.2	2.4	14.9 (45)
Unwelcome	10.9 (33)	3.6 (11)	1.3 (4)	3.3 (10)	5.6 (17)	12.5 (38)	9.9 (30)	6.3 (19)	10.9 (33)	9.6 (29)	12.9 (39)	Welcome	6.8	3.0	13.2 (40)

Standard Item Alpha For Scale Reliability = 0.95

Mean Scale Score = 47.8 Standard Deviation = 16.9

*The data are presented as percentages with frequencies contained within parentheses. The percentages may not sum to 100.0% due to rounding error.

Table 5 : Correlation Matrix For Attitudes Toward The Extent and The Direction of Change In A Reservoir Impacted Community (N=303)

	Direction Of Change	Extent of Change	Perceived Benefits	Perceived Costs	Sex	Age	Education	Early Socialization	Length Of Residence	Participation In Outdoor Recreation	Perception of Recrea-tionists
Direction Of Change	1.00										
Extent of Change	-0.29	1.00									
Perceived Benefits	0.55	-0.01*	1.00								
Percieved Costs	-0.47	0.42	-0.11	1.00							
Sex	0.06*	-0.05*	-0.11	-0.17	1.00						
Age	-0.18	0.02*	-0.20	0.05*	-0.06*	1.00					
Education	-0.11	0.00*	0.02*	0.05*	-0.10	-0.10	1.00				
Early Socialization	0.22	-0.20	0.19	-0.17	0.02*	-0.21	0.14	1.00			
Length of Residence	-0.34	0.15	-0.28	0.25	-0.05*	0.61	-0.09	-0.39	1.00		
Participation In Outdoor Recreation	0.14	0.01*	0.23	-0.02*	0.05*	-0.27	0.17	0.14	-0.19	1.00	
Perception of Recreationists	0.58	-0.33	0.37	-0.50	0.06*	-0.05*	-0.02*	0.10	-0.20	0.10	1.00

*Not significant at the .05 level.

Table 6: Step-Wise Regression Analyses For Extent of Change In a Reservoir Impacted Community Presented In Standardized Regression Coefficient Form (N=303)

Step Number	Perceived Costs	Perception of Recreationists	Early Socialization	Perceived Benefits	Sex	Early Socialization	Length of Residence	Age	Adjusted Coefficient of Determination	F-Ratio of Entering Variables
Step 1	0.417	---	---	---	---	---	---	---	0.171	63.3
Step 2	0.335	-0.163	---	---	---	---	---	---	0.188	7.5
Step 3	0.315	-0.161	-0.123	---	---	---	---	---	0.200	5.6
Step 4	0.299	-0.212	-0.144	0.124	---	---	---	---	0.211	4.9
Step 5	0.304	-0.213	-0.145	0.128	0.032	---	---	---	0.209	0.4*
Step 6	0.303	-0.213	-0.148	0.123	0.030	0.025	---	---	0.207	0.2*
Step 7	0.300	-0.214	-0.142	0.127	0.031	0.026	0.016	---	0.205	0.1*
Step 8	0.299	-0.213	-0.142	0.126	0.030	0.024	0.025	-0.014	0.202	0.0*

*Not significant at the .05 level.

Table 7: Step-Wise Regression Analyses For Direction of Change in a Reservoir Impacted Community Presented In Standardized Regression Coefficient Form (N=303)

Step Number	Perception of Recreationists	Perceived Benefits	Perceived Costs	Education	Length of Residence	Early Socialization	Sex	Age	Participation In Outdoor Recreation	Adjusted Coefficient of Determination	F-Ratio of Entering Variable
Step 1	0.578	---	---	---	---	---	---	---	---	0.331	150.8
Step 2	0.435	0.389	---	---	---	---	---	---	---	0.461	73.2
Step 3	0.288	0.413	-0.278	---	---	---	---	---	---	0.517	35.8
Step 4	0.287	0.415	-0.273	-0.100	---	---	---	---	---	0.525	6.3
Step 5	0.289	0.384	-0.244	-0.112	-0.120	---	---	---	---	0.536	8.0
Step 6	0.292	0.378	-0.238	-0.118	-0.102	0.053	---	---	---	0.537	1.5*
Step 7	0.291	0.383	-0.234	-0.115	-0.101	0.053	0.027	---	---	0.536	0.5*
Step 8	0.291	0.382	-0.236	-0.116	-0.092	0.053	0.027	-0.013	---	0.535	0.1*
Step 9	0.291	0.381	-0.236	-0.117	-0.093	0.053	0.026	-0.011	0.009	0.533	0.0*

*Not significant at the .05 level.

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